NATURALIZED MUGO PINE IN NEW HAMPSHIRE[1]

RADCLIFFE B. PIKE & A. R. HODGDON

The senior author has been aware for a number of years of a pasture in which the mugo pine (*Pinus mugo* Turra.) has become naturalized. So far as we are aware this is the first report of this species becoming adventive in North America. Spontaneous naturalization of any non-native species is always of interest as a matter of record. It would seem in this case to be of special interest to foresters and farmers of Northern New England as a possible new weed tree of forest lands and pastures.

This pasture is located in the town of Shelburne, Coos County, New Hampshire, approximately 44° 20′ N. It is just south of the Androscoggin River and U. S. Highway #2 a few miles from the Maine border. The property adjoins the grounds of the Shelburne public school and is directly across the highway from the former Aston estate, now the Shelburne Motel and Inn.

It was on the grounds of this former estate that mugo pines were planted as ornamentals fifty years ago. A number of the original plants are still in existence and are now very large specimans yet still retain the typical mugo form of multiple trunks and bushy growth. Whether any of these pines were planted across the highway is not known but there are certainly none at the present time on the pasture site that approach the size or apparent age of those of the original planting.

This is a sloping pasture with uneven drainage conditions and is 5-10 acres in extent. It is well occupied by mugo pines of various sizes and ages from seedlings to plants 12 ft. or more high and as much in breadth. All the plants observed had multiple trunks and the typical mugo form. None was found with a single central upright main trunk (of the montana type). Seedling mugo pines were observed in the highway ditches and on graded banks on both sides of the highway as well as on a steep raw gravel bank next to the school grounds. This tendency to colonize a variety of sites with different drainage bears

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out Shaw's[2] statement that "it grows indifferently in bogs and on the rocky slopes."

Associated with the mugo pines were two native pines, *Pinus strobus* L. and *Pinus resinosa* Ait. as well as scattered poplars (*Populus tremuloides* Michx.) red maples (*Acer rubrum* L.) and gray birch (*Betula populifolia* Marsh), the usual invaders of abandoned pasture land in this area.

Considerable variation was displayed in the general outline and proportions of these shrub pines from flattish ovoid to upright ovoid. The foliage also showed variation in depth of green and general density. Needle length on the collected specimens varies from 2½ cms. to 6½ cms. Cones showed the great variation in size and shape that is characteristic of this polymorphic species. Shaw[2] emphasizes the variations in the cones by calling attention to the "elaborations that may be seen in Tharand Jahrbüch of 1861 and" — also "Hartigs' Specifications of 60 forms of this species each dignified with a Latin name." Cone specimens were collected which agreed with the three types illustrated in Shaw[2], p 57. Specimens of cones and foliage are deposited in the University of New Hampshire herbarium.

One other site of spontaneous colonization of mugo pine has been casually observed in the State of Maine. This is at the east end of the Waldo-Hancock bridge on Verona Island in the town of Verona in Hancock County. About 30 years ago mugo pines were used, as landscape material on the approaches to this bridge and are the obvious source of these spontaneous seedlings. However no detailed examination has been made or material collected.

A recent report indicates another probable area in northern New Hampshire where this pine has become naturalized; however we have not yet made personal observations to confirm this.

These observations indicate that some caution should possibly be exercised in the use of the mugo pine for landscape purposes in areas where it can easily escape to wild or unused lands because under some conditions it is capable of spontaneous nat-

[2] SHAW, G. R. The Genus Pinus. Publ. Arn. Arb. No. 5. 1914.

uralization. Such caution is probably only necessary in Northern New England where the mugo pine is generally free of insect infestation that further south could be a deterrent to its successful spread. — DEPT. OF HORTICULTURE AND DEPT. OF BOTANY, UNIV. OF NEW HAMPSHIRE, DURHAM.

DISCOVERY OF ARENARIA MARCESCENS IN THE UNITED STATES. — While botanizing in northern Vermont this past summer the writer collected a species of *Arenaria* which he at first thought to be *A. groenlandica,* known from alpine areas in the state. However, upon subsequent examination the specimens were found to be distinctly different from *A. groenlandica,* closely resembling the description of *A. marcescens* given in the 8th edition of Gray's Manual. Additional material was later collected and sent to Dr. Marcel Raymond of the Montreal Botanical Garden who kindly confirmed the identification of the plant as *Arenaria marcescens* Fern.

The station for the plant is at an altitude of about 3200 ft. on Haystack Mountain in the town of Lowell, Orleans County. Here a series of north-facing serpentine ledges is moistened by seepage from the top of the mountain and provides a habitat suitable for plants of arctic-alpine affinities. *A. marcescens* is found growing abundantly in crevices and shelves of the ledges, often trailing down thus giving a hanging basket effect. Other species associated with it are *Lycopodium Selago, Agrostis borealis, Scirpus caespitosus* var. *callosus, Empetrum nigrum, Vaccinium uliginosum* var. *alpinum, Houstonia caerulea,* and *Campanula rotundifolia.* Of these, *Agrostis borealis* and *Empetrum nigrum* were previously reported in the state only from the summits of Mt. Mansfield and Camels Hump.

The distribution of *Arenaria marcescens* as given by Fernald in Gray's Manual of Botany, 8th edition, is western Newfoundland and Mt. Albert, Gaspé Co., Quebec. Its occurrence in northern Vermont represents a notable extension south of its previously known range as well as being an interesting addition to the flora of the United States. Specimens have been deposited in the writ-